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and

THE SCIENCES SUPPORTING PUBLIC HEALTH

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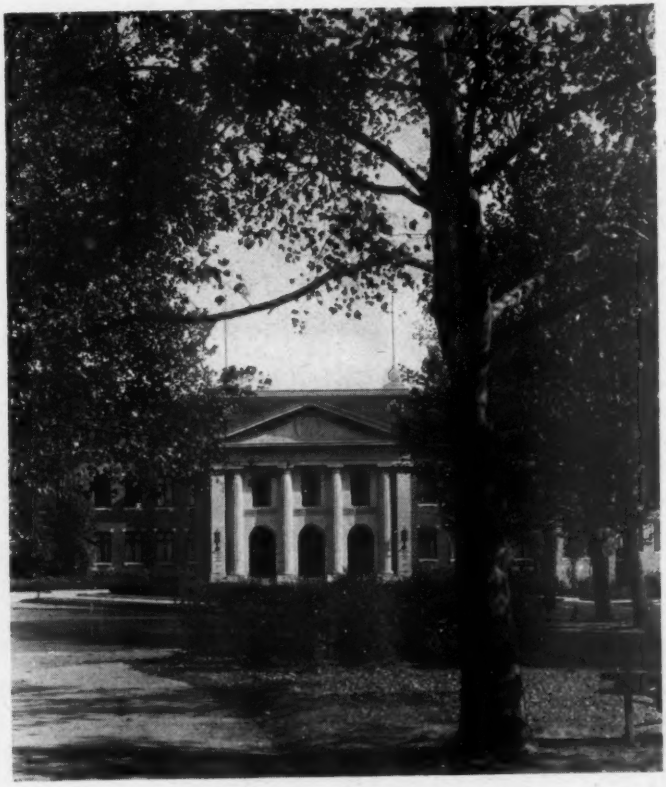

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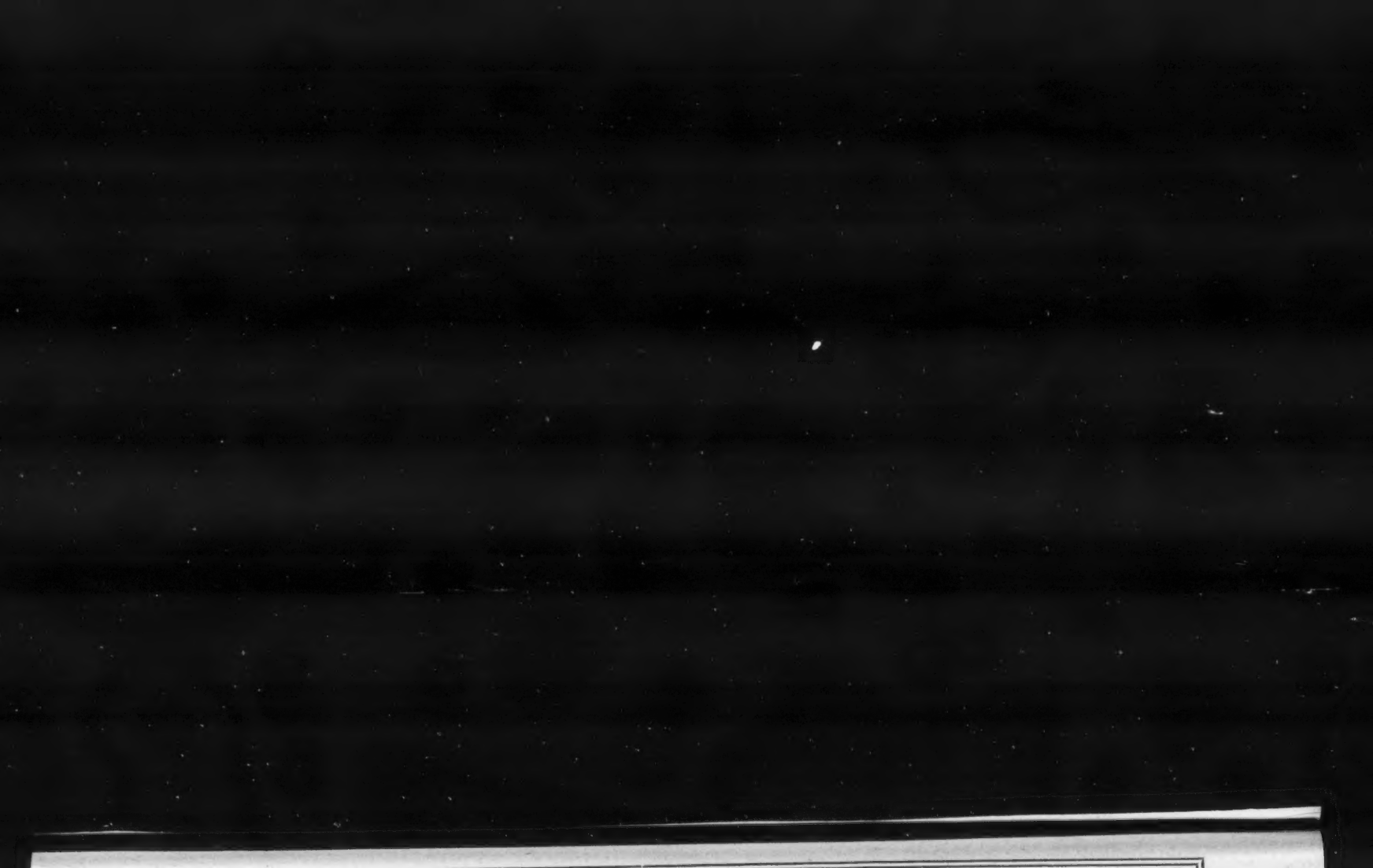

AMERICAN JOURNAL OF PHARMACY

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

Since 1825

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EDITORIAL

"PIONEERS OF AMERICAN MEDICINE"

A SERIES of paintings immortalizing outstanding men in American medicine was instituted in 1938 by John Wyeth and Brother, Inc., of Philadelphia. Since that time five paintings have been completed as follows:

"Beaumont and St. Martin,"
"Osler at Old Blockley,"
"Conquerors of Yellow Fever,"
"The Dawn of Abdominal Surgery,"
"The Father of American Pharmacy."

The last of these was unveiled at ceremonies held in Philadelphia on November 5, 1943. Its beauty as a work of art is exceeded only by its unbelievably fine detail. The artist, Dean Cornwell, deserves the greatest praise for this excellent work.

We were impressed with a number of circumstances attending this great honor given that great pharmacist, Procter, so much so that this number of the JOURNAL is dedicated both to him and this painting memorializing his contributions to pharmacy and medicine. In the first place Procter himself edited the *American Journal of Pharmacy* from 1850 to 1871, during which time he made the bulk of his contributions to science. It seems, therefore, quite fitting that this, his journal, should now devote its pages to one who did so much toward its publication for those twenty-odd years. In the second place it seems very appropriate that Dr. Ivor Griffith, who likewise edited this JOURNAL for twenty years, should have been chosen to deliver

the dedicatory address at the unveiling ceremonies, which we print in full in this issue.

Insofar as the selection of Procter is concerned, no better choice could have been made. There have been many other great men in American Pharmacy, but Procter was truly a pioneer. His efforts were indeed tireless, as a perusal of the literature of his day will show. In addition, Procter founded or helped start many of the organizations and institutions, such as the American Pharmaceutical Association, that now render national service to our profession and the public. His writings reflect his deep belief in pharmacy as a science and health profession as well as a broad perception of its responsibilities and problems.

Organized pharmacy may well be proud that a pharmacist was chosen as one of the immortals deserving a place in "Pioneers of American Medicine." Those officials of the company who decided to honor a pharmacist in this manner deserve the highest commendation. All too frequently we find in certain fields of pharmaceutical endeavor a tendency to minimize pharmacy by masking what is in truth pharmacy behind a meaningless designation such as "manufacturers to the medical profession," "manufacturing chemists," etc. Pharmacy needs men and organizations that believe in it—men who like Procter are proud to acknowledge their participation in this ancient and honorable profession and to do their share in gaining full recognition and respect for its services.

L. F. Tice

WM. PROCTER, JR.—FATHER OF AMERICAN PHARMACY *

By Ivor Griffith, P. D., D. Sc., F. R. S. A.

PRESIDENT Frank Law, Representatives and guests of the distinguished house of John Wyeth and Brother, most of us practitioners and exponents of the several professions serving the great cause of public health, and all of us now joined in the greatest task that ever faced this Republic, the winning of victory through God, our might and our sense of decency, over a powerful, vicious and God-forsaking, and I hope God-forsaken enemy—I salute you!

I salute you upon a friendly occasion—upon an occasion when a lightning like blight is arrested long enough to give us time to pay our little homage to the past and to acknowledge our great indebtedness to a man who now sleeps in silent dust but whose benevolent bequeathments are a very present blessing to all humanity.

Chiselled deeply in one of the blocks of marble, by the main portal of the Archives Building in Washington, is the phrase, "The past is but the prologue to the present," and the significance of this phrase is impelling, not just with respect to the prominence of today's problems, but with the knowledge that we cannot look forward to our tomorrows with hope of accomplishment unless we know yesterday's lessons with understanding and with a certain affection.

The House of Wyeth has done a fine service in commemorating the contributions made to human weal and human heal by great pioneer American physicians, pioneer American physiologists, and pioneer American surgeons. Tonight it pays its tribute, and so do we, gladly, to another branch of the arts and sciences serving public health. Here in dedicating this glorious painting of Procter, the Father of American Pharmacy, we are gathered to honor not the memory of this great man alone, but to honor the whole Profession of Pharmacy as well. As you may well ask, so conglomerate and confounding is the current picture of the practice of this ancient and honorable pro-

* Dedicatory Address given at the Unveiling Ceremony of the fifth in the Series of Paintings, "Pioneers of American Medicine," Philadelphia, November 5, 1943.

fession, "Just what is Pharmacy?" And I respond with a definition from a book: "Pharmacy is the science which treats of medicinal substances. It embraces not only a knowledge of medicines and the art of preparing and dispensing them, but also their identification, selection, preservation, combination, analysis, and standardization."

"But," objects someone, "Pharmacy has changed, and for the worse. The 'pharmacy' of today is in no wise to be compared with the good old, dignified old, serviceable old 'pharmacy' of other days."

Continues the critic: "Are not the beloved old apothecary and his sweet idyllic days gone? The druggist today is largely a merchant of parts. His day of peace ended when he abandoned the colored lights in his windows and added fly paper to his stock of medicines. He has been adding things ever since. It is a long time since drugs made a druggist. Nowadays it is cameras, cosmetics, candlesticks, and cutlery."

To which we react—and promptly—with: "Those things are not pharmacy and never were nor will be." The textbook definition is as applicable as ever it was—indeed much more so.

Certainly the dear old apothecary is gone. So has the fine old family doctor, who once cavorted over fifty fields of medical service now patrolled by fifty specialists.

Where is the obstetric, gynæcologic, chirurgic, neurologic, chiropodic, pædiatric, urologic medico of fifty years ago?

Is America any the worse for his passing out of the picture? Certainly our national health statistics speak clearly in favor of the modern pattern of medical practice!

Americans now live longer than ever a people did before, and death is getting to be more objectionable than ever it was.

And as with medicine, so too with pharmacy. The pharmacy of today is better pharmacy, better insofar as it serves the public in a better way—far better, far truer to its definition than ever it served before.

Certainly its external aspects have changed!

No longer is the corner drug store the only habitat of the calling. For it has wandered far afield. The demand for medicinals is larger than ever in history; the range and scope of medicinals are likewise enlarged; the need for uniformity and stability in drugs is more exacting then ever, and to cope with all of these requirements was much beyond the capacity of the man in the corner drug store.

Is it surprising then that specialization came his way, too, exactly as it did in medicine? The textbook definition seemed once to be quite within the compass of one practitioner, but not so today. For the identification of drugs is now a science of itself—their selection, their stabilization, their analysis, their standardization—all are specialties—all are single sciences.

So has pharmacy ramified.

The tremendous drug industry—huge drug collecting organizations and milling concerns, large organic and inorganic chemical manufacturers, immense pharmaceutical establishments, biologic laboratories, and institutes of pharmaceutic research—all of these are the pharmacies of today, with the corner drug store only a small though important corner of a very large and impressive picture. In the pharmaceutical plants, plasters, once clumsily spread on a few inches of cloth, are now machined by the mile; capsules, then dozened by hand (and not too accurately), are now precisely made in large quantities; elixirs, lotions, pastes and unguents are no longer thimbleful things, but produced in terms of amazing tonnage. This is indeed the day of mass manufacture of medicines and by the same token the day of careful, standardized production.

Mind you, all of this is not in derogation of the corner drug store that functions in a high, serviceable way. For, as the important, prescription-compounding, medicine-supplying station, the corner drug store is and always will be a responsible, serviceable spot in every stable American community.

But this occasion belongs primarily to William Procter.

And to that end may I have the further company of your minds in searching for and finding inspiration in the life story of this truly great man, William Procter, Jr.

On a gloomy morning in September, 1793, the good ship "William Penn," slowly making its way through Delaware Bay and headed for Philadelphia, was stopped by a quarantine officer and the passengers were landed at Gloucester, New Jersey. This step was necessary because yellow fever was raging in Philadelphia. The travelers crossed the Delaware, skirting the center of the city, and proceeded to Germantown, thence to Morrisville, stopping on the first day of the week to attend a Friends' meeting at Fallsington. After the meeting they were invited to dine with one of the Friends. Such was the quiet hospitality of that day and age. Such too was the lavender and old lace romance of that period when one of the young

men of the party, namely Isaac Procter, who had homespunned all the way from Yorkshire, England, met Rebecca Farquahar, dressed in the unpretentious but sweet habiliments of a Quaker maiden. Procter forthwith fell in understanding love with the young lady, and I am told that a Quaker in love is a power not to be denied. On the third day of the eleventh month, six years later, Isaac and Rebecca were at long last duly wed at the same meeting house at Fallsington.

Together they moved to Baltimore, where they resided happily and prosperously, raising a large family, the ninth and youngest child of the union being William Procter, Jr., the Junior being added to distinguish him from his Uncle William. The boy was born on the third day of the fifth month, 1817.

When a little over three years of age, Procter lost his father, who, strangely enough, was stricken with yellow fever, the very disease which occasioned his avoidance of Philadelphia years before. Although the family had been prosperous, unexpected claims were made upon the estate, which although considered by the family to be unjust, were not resisted. In consequence, William was deprived of the liberal education which would have befitted a mind so well calculated to receive generous instruction and which might have given additional lustre to his mature years. At an early age, therefore, he was taken from school and placed to earn a meager penny in a copper shop, where he acquired a knowledge of tools and a dexterity in the use of them which served him many a happy turn in after life.

In 1831, at the age of 14, he entered the drug store of Henry Zollickoffer, bound by indenture as an apprentice, and was extremely happy with his work. His mother in Baltimore continued, through correspondence, to inculcate into him a spiritful and spiritual education. From one of her letters sent to him on the sixth day of the seventh month, 1831, I quote—and please listen to it carefully for the wholesomeness and decency of its expression. Thus, does Mother Procter write to her boy, William:

> "Let it by thy study to endeavor to please [thy employer] not only when in the store about thy every-day business, but in everything. There are many ways of gaining the affection of those we are with by being kind and obliging to all, and if thee can lend a hand or help in any way, no matter how small the act is never be backward, but with cheerful alacrity be always ready; this will cost thee very little, and by a kind and courteous deportment in the store and out of it, thou wilt gain the love and

> good will of all around thee. True politeness, my son, is a lovely accomplishment, but above all, never, never equivocate to screen thyself from censure, but if thou shouldst get into any difficulty be open and candid. Let honesty and integrity be visible in all thy actions, and thus, my son, I think, thou wilt never want a friend in man, and thou wilt have a friend in thy Heavenly Father, who can, and will, if thou love Him as thou ought, do more for thee than all the world beside. Therefore, my dear boy, 'seek him now in the days of thy youth'; it is never too early to begin. There is another point on which I wish to remark—that of keeping everything thee may ever know relative to thy master's business entirely within thy own breast, some times by tattling or telling little matters to others it has often been a cause of a great deal of mischief and uneasiness, if not unhappiness; therefore thou wilt be guarded on this subject, never trust even thy own dear friends with anything relative to thy employer's business thou might suppose he would not be willing for everybody to know; and always stand open to reproof, I have no doubt, if necessary, it will be administered in meekness and in love."

And what a training in human relationships is tabloided into this mother's letter to a son—and what a challenge to the modern parent who all too often forgets that Education, really, begins at home. And it is not trite to say that the good counsels of this Christian mother were received into good ground and brought forth goodly fruit.

Procter continued to the end of his apprenticeship, manifesting much interest in the outposts of chemistry and physics and pharmacy. In March, 1837, he submitted to the Philadelphia College of Pharmacy his thesis on "Lobelia Inflata," a paper of great merit in which he demonstrated for the first time the presence of the alkaloid "Lobeline," and passed a successful examination as a candidate for the diploma of the college. He even anticipated the graduate studies of modern curriculum by attending lectures given by Doctors Hare, Mitchell, and Bache in the winter of 1840, and somewhere in his writings expressed his amazement at the solidification of carbonic acid. Thus over a hundred years ago that commodity which now as "dry ice" functions serviceably as a refrigerant, was known and manufactured by this young worker in pharmacy. He was also greatly interested in electricity, and himself constructed an electro-magnet capable of supporting several ounces.

In 1844 he opened a pharmacy, and a circular issued on opening day, bearing the date of the thirteenth day of the fifth month, carries

BY DEAN CORNWELL, N.A.

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The Father of American Pharmacy · WILLIAM PROCTER, JR. (1817-1872)

this announcement: "In reference to that important branch of the business embracing the compounding of medicines and physicians' prescriptions, I believe that a regular education at the Philadelphia College of Pharmacy and my twelve years of experience in one of the first establishments of this city will enable me to give satisfaction."

In October, 1847, he became Professor of Pharmacy at his Alma Mater, and thus initiated his active contacts with the institution and with the profession of pharmacy, contacts which he zealously and fruitfully followed to the day of his death.

Procter knew Paracelsus, but he loved Galen better, and most of his researches were in and of the botanical kingdom.

This seems an appropriate spot to linger long enough to hazard the opinion that current researches in the pharmacological field have by-passed the botanicals too long. Penicillin, our most recent and spectacularly successful drug, is essentially a low grade botanical derivative. Some day it may be synthesized. But until then its production will continue a tedious work of poor productivity.

And who knows but that even the old-fashioned drugs, empirically used by folks of countryside for countless generations, may prove a fruitful field for pharmaceutic research.

In a mad scramble to squeeze out of the coal tar barrel every available virtue, research may have neglected the botanicals.

The spectacular successes of surgery, the overzealous and frequently illogical zoological fads and the overemphasized phases of bacterial medicaments, all have turned our eyes away from medicinal plant possibilities.

Our heads have been dizzied with serums, endocrines, vitamins, vaccines, surgical tricks—ectomy this—otomy that—transfusions, infusions, delusions—adjustments, psychopaths, osteopaths, neuropaths, naturopaths, and several other paths—and a few detours.

No one can convince me that even grandmother's fresh drug infusions or old-fashioned teas of garden herbs, had no especial value. In our scientific smugness have we neglected many of the commonplaces such as boneset and mullein, bitter apple and horse nettles, plantain and heal-all, liver-wort and tansy, pumpkin seed and mallow —and a host of other herbs and parts of herbs that have served the countryside for centuries with their healing ministrations?

For so truly as the Peruvian bark furnished the specific to the dread malaria, the white poppy of India its soporific juice, the oil from wormseed its hookworm poison, the Indian chaulmoogra its

leprosy treatment, the ephedrine of Cathay's ma-huang its asthma specific—equally true is it that there is a myriad of other plant antidotes of pain waiting for proper appraisal. It may be high time for a botanical renaissance.

Perhaps this current global calamity with its complications may have awakened us to a need for a new appraisal of the value, for the time being at least, of the botanical drugs. Consider how great was our need for quinine, a distinctly vegetable compound which has over the decades resisted all efforts dedicated to its duplication. Bataan and Corregidor might have had totally different implications had a supply of this vital botanical derivative been available at this critical time. And what a marvelous job has been done in this country even in the course of the last two or three years in making available natural plant drugs which in normal times had been imported into the country in great amounts. Digitalis, the outstanding heart drug, belladonna, the source of atropine and other important principles—valerian, hyoscyamus, squill, aconite and other drugs once could only be secured from Europe or elsewhere. Indeed, in a land where cardiac diseases are high in the death dealing scale, does it not seem strange that digitalis and strophanthus and squill and other heart active drugs had to come from Europe or elsewhere? And every time that Europe had a fuss of its own the great American heart went begging for its proper medicine.

But no more; thanks to applied research in the field, we have signed and sealed another Declaration of Independence. In peace or war we have no longer to depend on outside sources for these vital drugs. We are growing them ourselves, and from digitalis to cinchona. This is just commonsense insurance, and though it took a global war to persuade Uncle Sam to do it—it is an investment never to be forsaken.

For twenty-eight years Procter was associated with the AMERICAN JOURNAL OF PHARMACY as co-editor and editor, and how successfully his management was conducted is testified to by the volumes issued during that period. The original matter from his pen and his judicious selections of the foreign literature gave to the journal a value and standing among American scientists, and made it the most complete history extant of that period of progress in pharmaceutical science in the United States. His versatility and his industry in the direction of research and in recording research are attested to by the fact that the index of the journal lists some five hundred and fifty

separate articles of his contribution, and this is exclusive of abstracts and editorials. No man of the time had such an outlook commanding the horizon of the pharmaceutical art and particularly of pharmaceutical research.

"Father of American Pharmacy," yes—but more aptly perhaps "Father of American Pharmaceutical Research."

Said the immortal Pasteur, "Take interest, I implore you, in those sacred dwellings, which are designated by the expressive term 'laboratories.' Demand that they be multiplied, that they be adorned; these are the temples of the future—temples of well being and of happiness. And there it is that humanity grows greater, stronger, better."

It may be said of the pharmaceutical profession that beginning with Procter, it has answered Pasteur's ringing challenge with as much fervor and intelligence as any profession in the field. And pharmaceutical research is humanitarian research. Pharmaceutical research is dedicated to the discovery and eventually to the intelligent distribution of materials to ease the heavy hand of pain, to curb disease and to strengthen and lengthen human life in such wise that when twilight does inevitably come, it will come gently as the folding of the Arab's tent, and as silently steal away.

I was recently asked, and rather sarcastically, to explain what I meant when I referred to Pharmacy's contribution to the war "action." In response I called attention to the aftermath of the Salerno beach-head battle, and the sharply lessened number of casualties resulting because the injured recovered so quickly. My answer was countered by his compliment to the doctors, surgeons, and nurses who were on the job, with which I, of course, agreed. But what he had failed to recognize was that it was the blood plasma, the sulfonamides, the antiseptics, etc., which had revolutionized the treatment of the injured and produced the results at that amphibious engagement, where only 1 per cent of the injured failed to recover. And, furthermore, my querist had also failed to recognize that it was the research and production departments of the large pharmaceutical houses that had developed and supplied these vital drugs, supplied them in prodigious quantities, and with every unit made dependable through assiduous control. America would have a new conception of Pharmacy if every citizen might have a chance to visit the research and manufacturing departments of the great American drug houses, to see the workers in action, to see the purpose of these fine establishments, and know the good that is being accomplished.

Someone has asked whether scientific research is justified if it can be charged that it has contributed to this current world calamity. The truth is that this war was in no sense the fault of research. If science in any way fabricated this war, it was only because the nobility of science was prostituted.

The day may yet come when science, kept pure, will bring to the world the gift of permanent peace. Who wants Java except for her rubber and quinine? When rubber and quinine are made in the shop then Java will not be such a bone of contention.

That sounds something like an Utopian argument—yet it is toward Utopia that the human race must point if this world is ever to be a comfortable place in which to live.

And I am enough of an Utopian to be even more proud of research dedicated toward the humanitarian prospect than the utilitarian.

And William Procter was a teacher as well as writer and researcher. He was a good methodical teacher. He taught in spirit and in truth. He had those certain qualities of humility, of guidance, persuasion and restraint that made him capable of leading others willingly into the domain of resourceful happiness. He was a man of gentle manners and he had a glorious disposition to play fair in the game of life. Of such stuff are good teachers constructed.

Indeed, in the entire field of American Pharmacy, throughout the decades of its existence, no one has presented the many-faceted talents that were present in this one man, and it is scarcely strange that because of his unceasing industry and constant mental exercise, his rather frail physical vessel did not long endure. He died at the early age of fifty-six, mourned by all who knew him. On a Tuesday afternoon in February, 1874, with the wild winds of winter hurling snow against the window panes on the second floor of the small new school on Tenth Street, Dillwyn Parrish, in somber Quaker garb, addressed the College membership. Said he: "On Tuesday morning, the 10th inst. the intelligence was spread among us that Professor Procter had died during the night. So overwhelming was the sense of the loss we had sustained, that our hearts were mute with grief.

> "Slowly, but not with less impressiveness, comes to us the realization that the voice, so lately heard in instruction and in counsel within these walls, is now sealed in death. While mourning a loss which seems to us almost irreparable, it is fitting that we should call to remembrance that many benefits which the life of our brother has bestowed upon us. For a quarter of a cen-

tury his name has been inscribed on our banner, and we have found it a talisman of strength.

"His life was characterized by earnestness of purpose, single-minded in pursuit of science, sincere, in all his relations in life, loving Truth for Truth's sake; his enemies are unknown, but friendship is claimed wherever his name is spoken.

"The record of his life is engraved on the character of this institution, whose journal is an enduring monument to the activity and ability of his genius. His name comes back to us from beyond the Atlantic in pharmaceutical literature with acknowledged authority. Well may the drapery of mourning be hung upon these walls, and our eyes turn in depressing sadness to the vacant chair."

Procter's prodigious works covered such a vast field that it is difficult to explain why posterity has not attached his name to some specific discovery. He pioneered with ether, he was one of the first to discover the salicylates of natural origin, thus anticipating the universal exercise of these substances in the treatment of disease. Indeed, he pioneered in a hundred such ways.

On Philadelphia doorsteps in early morning, thousands of little white monuments of milk memorialize the great Pasteur, yet the process of pasteurizing milk was only a fraction of Pasteur's inventions.

Ehrlich is remembered by more, not for his fundamental researches, but because of the pretty story attached to his 606.

Bunsen was a great man in many fields, yet the average person only remembers his burner.

Liebig's name lives in the household not because of his notable and divers inventions but because he gave his name to an extract of beef.

Such are the caprices of euphony and cacaphony.

But the name of Procter has been in itself a monument although every bottle of Tincture of Digitalis might well be considered his memorial. Procter's name will live forever, not for any single achievement, but because of the mastery that he gave to all his work. His works earned for him a full entitlement to the designation "Father of American Pharmacy."

William Procter, Jr., lived in those staid and steady Philadelphia days when, between the cobble stones, the grass grew green on High Street—and the wood thrush still maintained his nest—and sang his merry song on the banks of a clear blue Schuylkill.

It was the golden, quiet Quaker age of Philadelphia town—when even progress moved on velvet wheels and the gentle hand of peace was on the land and people.

They were the days, before the whirlwind—those mellow, fallow days, when art was strangely short and time not half so fleeting.

Those were the days before the subtle magic of subsidy sought to still and stun the basic human freedoms, days when men owned opinions, and fought and died to keep them. Such were the days and here the place where William Procter lived and worked in serious Quaker company. These were men of diligent and forward-looking minds, not merely marking time of day, but strengthening their present with deeds and dreams and bequeathing rich tomorrows for us their children yet unborn.

How unlike now, when government by man too promptly makes bad debts—instead of better deeds—to count as their inheritances.

But the Quaker way was a different way, and Procter was a Quaker.

Here in Philadelphia tonight, while the dust of William Procter rests in a quiet New Jersey green acre of God, we foregather to bring reverence to his memory. It is meet that we devote and dedicate a masterpiece in painting to this honored saint in science—lest we forget, for Procter himself was a master artist. His pioneer work was elemental and true. A whole school of devoted pupils had their inspiration from him. Research in the healing arts has flourished because Procter so humbly, so devotedly, so thoroughly, and so beautifully, painted his pattern for posterity.

And may I conclude this meager tribute to a great man's life, and his clear entitlement to a long remembering, with this inspired, inspiring challenge from the pen of great Carlyle:

> "Could each here vow to do his little task as the one whom we now honor did his great one—in the manner of a true man—not for a day but for the ages; to live as he lived and counselled—not commodiously and conveniently, in the Reputable and Plausible, in the Half, but resolutely in the Whole, the Good and the True."

QUININE—AFTER THE WAR*

By T. W. Delahanty and E. D. Schutrumpf **

"MALARIA in its many forms constitutes one of the great scourges of mankind today—if not the *greatest*. It poses problems of the utmost immediate and future importance." These statements were made on the floor of Congress, a little over a year ago. Those conversant with the facts think of the malaria belt in the United States and the millions in our military service in contact zones throughout the world, as well as the responsibility that we have assumed through Lend-Lease and Relief and Rehabilitation. Additionally they ponder its consequences, as we plan the necessary activation of our Good Neighbor Program for Latin America and other areas where this malady is endemic.

In an economy such as ours, wherein the factors of efficiency and constructive effort hold such a prominent place, the continuing debilitating effect upon those afflicted and the ever-threatening spread of the disease are particularly challenging. Records indicate that people in uncontrolled malarious areas seem in many ways incapable of sustained progress, a fact which gives rise to thought of the current problems (but more particularly of the *future* problems) in this connection. For example: it has been estimated that malaria afflicts one-third of the world population (or perhaps as many as 800,000,000 people), an unfortunate group who, under repeated attacks of the disease, have lost their initiative; more significantly, they are vectors for contaminating others through the carrier mosquito. Malaria represents an element working counter to the attainment of higher living standards. Consequently, were all sufferers assured adequate supplies of quinine, the only known specific, hand in hand with alleviation should go the incentive to eliminate the carrier and eradicate the globe-encircling disease.

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* Reprinted from *Foreign Commerce Weekly*, Nov. 6, 1943.

** Drugs and Pharmaceuticals Unit, Bureau of Foreign and Domestic Commerce.

Roots of the "Quinine Crisis"

Associated with the present-day problems of meeting military and civilian requirements of quinine and the planning of cinchona cultivation is the problem of "quinine after the war." Many persons who are now expressing concern over the situation feel that some type of international agreement or control should be effected to prevent a recurrence of a crisis in the world's quinine supply such as occurred with the fall of the Netherlands Indies.

The present critical situation with regard to supplies and the uncertainty as to future prospects of replenishing the United States diminishing quinine stocks are undeniably the result of uncoordinated pre-war control of production, distribution, and prices of cinchona bark. During the stages of early quinine development there existed at times localized overproduction which resulted in a drop in price; moreover, the improvement in the quinine yield of the bark through scientific cultivation was a factor contributing to the economic crises in the cinchona-bark cultivation of a number of countries.

The Case of Ceylon

Such an instance developed in the case of Ceylon, which in 1886 produced some 15,000,000 pounds of cinchona bark, more than half the world's production at that time. Because this enormous production upset the European market, the exportation of bark from Ceylon fell as rapidly as it had risen. The resultant slump in prices was a boon to the consumer but disastrous to the planter. In consequence, the industry collapsed, and with it went all incentive to continue British cinchona development in Ceylon. Lack of scientific cultivation to increase the quinine yield has also been cited as a factor contributory to the collapse, which severely depleted the world's resources of cinchona bark.

Ironically enough, a survey of a recent malaria epidemic in Ceylon found that country regrettably unprepared to meet the emergency. Out of a population of 5,000,000 persons, about 1,500,000 cases resulted in a mortality of 70,000, according to a statement of Dr. L. T. Coggeshall in the May 1 Journal of the American Medical Association.

Other countries having a high incidence of malaria are without supplies to meet the normal quinine needs of their own populations and, through failure to develop their cinchona resources, have had inadequate reserves to cope with epidemics.

India's Need

The extent of the Ceylon tragedy calculated in terms of human life can be evaluated only when one considers the needs of a country such as India which has some 100,000,000 malaria sufferers, only one-third of whom receive malaria treatment. This situation may be largely attributed to the lack of purchasing power of the lower income groups, many of whom are victims of the disease. They can afford only the bare necessities of life—much less quinine even at what might be considered a fair price. As a partial solution, the Government distributes quinine on a free basis or at cost, a system that might be extended to advantage. However, India can supply through its domestic resources only one-third of the requirements of the group mentioned, hence is a purchaser of large quantities of cinchona bark or quinine.

Today's Acute Emergency

In these war days, the unusual activity in movements of troops, refugees, or other groups of people—many of whom are nonimmune —through malarious areas, has made the need for a prophylactic more acute than ever. The importance of quinine as a strategic war material has focused attention on procurement of quinine from every possible source, notably the American Republics—the original habitat of the cinchona tree. This endeavor is at present being actively fostered by the Office of Economic Warfare.

Aside from the military angle, the world's constant and enormous quinine requirement for the treatment of civilian malaria prompts this discussion on quinine in the post-war period. The economic and sociological effect of endemic malaria upon the human race should be sufficient to remove quinine from the pale of "pure commercialism" into a realm of "national responsibility."

Of International Importance

A look into the future when the Indies shall be free of Japanese domination, presupposing that there will remain an appreciable portion of pre-war cinchona plantations, brings up the question: "What now about quinine?" Certainly it is apparent that the quinine problem is one of international importance, and many persons have expressed the conviction that aggressive thinking and planning should

be under way with a view to effecting agreement between the various nations which are suppliers as well as consumers of quinine and those nations which are wholly dependent for their supplies of either quinine or cinchona bark on the producing nations.

International cooperation is inherent in the malaria programs of: (1) the Rockefeller Foundation, (2) the Malaria Commission of the League of Nations. The Rockefeller Foundation Health Commission is supporting work in malaria chemotherapy in the United States, England, and India. For many years its activities in the field of malaria control have extended to cooperative work not only in the United States but in all parts of the world's malarious areas. The Malaria Commission held its first meeting in 1923 and was created as a result of conditions at the end of World War I. In 1918, the general malaria situation appeared aggravated, both by war conditions and the almost complete suspension of antimalarial measures, due to the disorganization of the general health services, the lack of doctors for civilian service, the insufficiency of quinine, and the lack of money. This Commission functioned continuously and as late as 1940, according to the latest available official journal of the League of Nations, was still in existence.

Malaria Commission's Work

The Malaria Commission, a section of the Health Committee of the League, included in its program: (1) study of malaria remedies including the appraisal of the therapeutic values of various antimalarials, natural and synthetic, (2) epidemiology of malaria in many of the countries of Europe and Asia, (3) assistance rendered, upon request, to many such countries in studying and planning programs for malarial control, through sanitation measures, establishment of medical facilities, educational measures, and related efforts, and (4) study of the world's resources of cinchona bark and quinine. With respect to the last item, much information was gathered in reply to a questionnaire, a report covering which was completed in 1932. Replies were received from 111 health departments of malarial countries, of which 93 considered malaria a problem.

The Malaria Commission was planning to call together an international congress for consideration of the following rather pertinent problems, proposals covering which had been brought up at a number of the meetings of the Health Committee:

1. Inquiry into the world's requirements of quinine.

2. Present production and means of improving this.

3. Determination of whether the total quantity of quinine produced by all the factories in the world could be regarded as sufficient for the requirements of prophylaxis on a large scale.

4. Consideration of the advisability of establishing new quinine factories under government control with a view to obtaining pure and inexpensive products.

5. Development of the cultivation of cinchona trees in new countries.

6. Cost of production and sale price.

7. Distribution of quinine by the State or sale by private traders.

8. Sanitation projects necessary for eradication of mosquitoes and for malaria control.

Collaboration Is Vital

It is apparent from the above that the many problems involved would require international collaboration and coordination in an endeavor to stamp out endemic malaria. It is not inconceivable to think in terms of international control or supervision such as that which is administered by the Drug Supervisory Body of the League of Nations (created under the convention of 1931) for Limiting, Manufacturing, and Regulating Distribution of Narcotic Drugs. True, the latter is merely a restrictive measure covering dangerous drugs. Any organized body which might be created for the administration of cinchona and quinine production, distribution, costs, and related factors would be of even greater service, since a large part of the population in malaria-infested regions are helpless victims. In the first place they are unable to purchase quinine for prophylaxis at existing prices, and secondly their respective governments have been unable to provide adequate protection through (*a*) present health services, including free distribution of quinine, (*b*) sanitation projects to remove or control conditions responsible for endemic malaria, which are not always feasible because of special geographical obstacles and a cost beyond the economic level of the population.

Today's Stepping-Stones

Stepping-stones to a possible international accord with respect to quinine and malaria control are the existing mutual-benefit agreements between the Governments of the United States and of a number of American Republics. Measures taken were the cinchona agreements, and the joint malaria-control program of the Health and Sanitation Division of the Coordinator of Inter-American Affairs and the American Republics governments where malaria is a major health problem.

The latter program represents an important step toward a united effort to stamp out malaria in the Western Hemisphere. Primarily, efforts have been made to destroy the aquatic and adult stages of Anopheles mosquitoes and their breeding places. In addition to the engineering-projects program, provisions have been made and additional plans are being formulated for establishing medical facilities, educating the people, and similar essential measures. All the while, much quinine will be needed and should be available in proportion to the needs of the respective countries.

Virtues of United Effort

An equitable distribution of quinine according to national requirements might be well developed from these programs and (after the cessation of hostilities) extended to other nations. The procurement program of the Office of Economic Warfare involving development of methods of collection of existing cinchona bark and the exploring of unexploited forests; and the cultivation of cinchona trees is well under way. One may perhaps visualize, without undue optimism, an extension of all these projects to other nations and a recognition of the virtues of international effort toward a common goal—eradication or at least control of endemic malaria and betterment of sociological and economic conditions in affected countries.

The suggestion for a centralized body of international scope will naturally bring to mind problems that may *seem* insurmountable, not the least of which is that of maintaining the economy of the leading producting countries. However, a program of equitable distribution of cinchona bark and quinine on a cost-plus basis, which would enable greater numbers of individuals to purchase quinine and the governments to carry out highly necessary health programs, is capable of producting better economic conditions than have formerly prevailed.

Great Benefits Visualized

Far-reaching and permanent benefits from such an international program are within the realm of possibility. For example: many people, as already stated, are incapacitated because they suffer from malaria; hence they contribute little, if anything, to the national economy. In addition they are a serious public menace, being vectors for infecting others through the carrier mosquito. Reverse the picture: they are effectively treated and become a source of labor—perhaps may even join the workers collecting bark, increasing numbers of whom are in great demand in many areas. Thus they contribute to the national economy and, by improving their living conditions, they help to bring about a higher level in national health standards. Further benefits will be realized by international cooperative sanitation projects for the eradication of the mosquito wherever possible and the control of malaria around infested areas. History has conclusively demonstrated that control measures in areas that were formerly unproductive have enabled such regions to develop industrially and agriculturally.

International experience through study of many types of malaria-control problems will be of invaluable assistance in coping with the different sets of conditions which will be encountered in the different localities throughout the world's malarious regions. The great need for an international cooperative effort was expressed in the recent statement of Surgeon General Parran of the United States Public Health Service: "Outside of the mental diseases there is no other disease [than malaria] of comparable importance against which we have made less progress during my generation."

Role of Other Antimalarials

So far no mention has been made of other antimalarials, such as totaquine, only recently officially approved in the United States, and the synthetics, atabrine and plasmochin. Each is of importance in the antimalarial program, and conceivably any international body might include them within the purview of a malaria program.

Stress has been placed on quinine, not only because it is the oldest and best-known antimalarial medicine but because, as a prophylactic, it is commonly considered superior to the synthetics. Furthermore, quinine may be administered safely by laymen or nonmedical persons; whereas a respectable segment of the profession believes that the syn-

thetics require experienced medical supervision. Totaquine is a product of cinchona bark, therefore is subject to the same supply problems as is quinine.

Medical authorities engaged in research are virtually agreed as to the desirability of treating malaria with a series of doses of quinine, atabrine, and plasmochin. Every one of these three remedies shows a proper action on the parasite in one of its phases of development in the human organism. As yet, no drug can guarantee the prevention of relapses. It is not inconceivable that research will one day develop a synthetic—or series of remedies—or some product, perhaps a vaccine, that will even afford immunity, making it possible to dispense with quinine entirely. Until that day, the existing natural and synthetic antimalarials will be required in large quantities for the treatment of malaria.

Industrial Applications

While the future of quinine should be contemplated solely from the humanitarian standpoint, there exist at the present time industrial uses of cinchona alkaloids—quinine and others—in numerous fields such at the metallurgy, paint, rubber, and textile industries, and in the manufacture of "Polaroid." The last-mentioned commodity represents a development of scientific importance because of the use of "Polaroid" in scientific instruments and eyesight-testing equipment and its broad application where light polarization is a factor, as in automobile headlights and windshields.

Expansion industrially might be considered as an economic expedient for future consideration in the event that an over-supply of quinine should develop as a result of diminution in the demand for quinine due to (1) progress in control measures with an attendant lowering of malaria incidence and (2) medical discovery of a totally effective suppressive drug, either natural or synthetic.

Must Fight Malaria's Ravages

In any event, if any form of international public health service were ever justified, the war has unquestionably demonstrated the need for an "insurance policy" against the ravages of this dread, insidious disease. Though some other disease may be known as the great killer, malaria has no competitor as the great incapacitator, and quinine is a prophylactic of universally recognized efficacy.

ECONOMIC REALITIES

TAXING VERSUS BORROWING TO FINANCE THE WAR

By Karl Scholz, Ph. D.*

THE money costs of the war are increasing by leaps and bounds. In addition to nearly 40 billion dollars paid to the Federal Government in 1943 in direct and indirect (hidden) taxes, the gross Federal debt by the end of 1943 exceeded 160 billion dollars. Over 100 billion dollars, or more than twice the National income produced in 1933, have been added to our National debt since our entry into the war. If the war continues through 1944 the gross National debt may rise to over a quarter of a trillion dollars.

The huge money costs growing out of the war, which for 1943 were around 90 billion dollars, may be paid either out of taxes or out of loans to the Government. These loans in turn may be made either out of the current money income of the people, or out of new deposits, money created by commercial banks. The former types of loans represent transfer of currently earned dollars to the Government and may be viewed as non-inflationary. If John Doe lends the Government $1000 of his earnings, which he has saved, he is not spending them, but lets the Government spend them for war purposes. His spending power decreases in proportion to which the spending power of the Government due to such borrowing, increases. If he were required to pay the $1000 he has saved in taxes, the effect on his spending power would be essentially the same as when he lent the money to the Government. Thus it is often alleged that taxing and borrowing to finance the war are basically the same. In either case, current income received is transferred from those who got it for their contribution to production, to the Government, to be spent for war purposes.

Moreover, the money borrowed from the people, when it is repaid after the war must come primarily from taxes levied by the Govern-

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ment. If John Doe paid $1000 of his current income to the Federal Government in taxes, he would have $1000 less to spend, while the Government would have $1000 more. On the other hand if he bought a $1000 War Bond, and after the war had to pay $1000 in taxes, so that the Government could pay back his $1000, he would in reality be giving the Government $2000 and getting back $1000. He would be out $1000, no matter whether he lent it to the Government or paid it in taxes in the first place.

But hope springs eternal! Since the John Does who buy war bonds may not be the same John Does who pay the taxes after the war to pay interest and repay the loans, they ordinarily prefer to make their "sacrifice" to help win the war by buying bonds, rather than paying current taxes "till it hurts." Yet it is somewhat of an illusion to think that the financial costs of the war are shifted to future generations, by borrowing rather than by taxing to finance the war. Such shifting may be possible, insofar as individual bondholders are concerned. But if the war loans are internal or domestic loans, and not repaid out of indemnities or reparations, they must be repaid out of taxes on the people, many of whom are also bondholders. Insofar as war bonds are held by those who pay taxes for debt payment after the war in proportion to their holdings, it will not be a case of "Robbing Peter to pay Paul," but "Robbing Peter to pay Peter." (No sinister implication is attached to the use of the word "Robbing.")

Since this is hardly likely, because bondholders and taxpayers are not identical in like proportions, post-war taxes for debt payments result in a redistribution of the national income, to the extent that bondholders benefit from the taxes paid by non-bondholders.

The possible tax frictions and political maneuvers growing out of large public debt payments after the war should not be underestimated. If the war bonds were to pass more and more into the hands of investment institutions and persons of large means, popular agitation for debt repudiation, in one form or another, might become a major political issue. Even if the National debt were to be converted into a perpetual annuity, on which interest were regularly paid, but the principle were never repaid, annual interest charges of possibly five billion dollars (2 per cent of 250 billion dollars) might become a serious matter, particularly during a major business depression. (There is as yet no conclusive evidence that Congress will be able to repeal the business cycle after the war!)

In the light of the foregoing observations, it would appear sound fiscal policy to finance the war, as far as at all possible, out of current taxes. In 1943 we were paying less than 40 per cent of the war costs out of tax revenues, and borrowing the rest. England and Canada were paying upward of 50 per cent of their war costs out of taxes. Every additional tax dollar that can be currently raised to meet necessary war costs, will mean so many less tax dollars that will have to be collected later to pay war debts. But there are both advantages and disadvantages to borrowing rather than taxing to finance the war. Borrowing gives the Government immediate control over idle funds, while it takes considerable time to legislate and collect taxes. Moreover, borrowing may get funds which it would be difficult to obtain through taxation. Again, borrowing makes possible the social appeal, which in times of total war is often more powerful than legal compulsion. "Give until it hurts" and "They give their lives, you lend your money" are familiar slogans. Lastly, there is always the assurance that the bonds will be repaid and the bondholder ordinarily does not relate his post-war taxes to his bond holdings.

On the other hand, in times of total war it is possible to "capitalize" patriotism, by exacting more and more tax revenues out of the income of the people, without necessarily impairing their productive effort. The ultimate test as to the soundness of financing the war out of taxes rather than borrowing should be the test of production. Only when taxes result in impairing productive efficiency and effort because they are viewed as unjust and excessive by taxpayers, will they begin "to kill the goose that lays the golden eggs." It is doubtful whether this condition has as yet been reached in our war economy with its swollen incomes, and every effort should therefore be made to finance the war program more and more out of current tax revenues. But at best there will still be a substantial margin that will have to be met by increasing the national debt.

While the foregoing discussion relates solely to taxing versus borrowing of current income to finance the war, the problem of inflationary borrowing or compulsory saving will be discussed in a later issue of the JOURNAL.

REVIVAL IN EL ORO

By John M. Clark *

Although there is considerable debate now in progress concerning our expenditures in South America, there can be no doubt but that our government's policy in that area has been in many respects fundamentally sound. Our future is very closely linked with that of South America and our readers may be interested in learning what we are doing in certain regions there. Since this report originates from that governmental agency responsible for the program its flavor of propaganda is both understandable and forgivable.—*Ed.*

IN the summer of 1942, a United States technical mission arrived in El Oro Province on the south coast of Ecuador to undertake a rehabilitation task. The province had been damaged in the border dispute between Ecuador and Peru. Normal economic life, already suffering from loss of foreign markets for cocoa and bananas, was disrupted during the fighting. A large part of the population, totalling around 40,000, had fled during the hostilities. In contrast with its name, which means gold in Spanish, El Oro had been through dark times. It was, in fact, the only task of rehabilitation involving a war-damaged area in the Western Hemisphere.

Now a year of rehabilitation work in the province is showing practical results. El Oro is rising from the disorder and despair of the conflict. The glow of a new era of work, reconstruction and good harvests have brought real meaning again to the name "El Oro." It is not a golden period of prosperity by any means. But El Oro is back on the road toward economic vitality. With the helping hand of a Good Neighbor and its own Ecuadorian Development Corporation, El Oro has recuperated substantially from the blows of the border quarrel and the economic disasters preceding the fighting in 1941.

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The tangible evidence of the area's recuperation is plentiful today. El Oro this year has a good cocoa crop, a record-breaking rice crop, fair yields of tobacco and coffee. These are the usual cash-yielding crops of the tropical lowland areas. The harvests of these are partly the result of the restoration of economic life since the settlement of the border dispute. It is revival in the old pattern of El Oro Production.

But there is revival in a new pattern, too. This new pattern comes out of the rehabilitation work and the hemisphere trend toward increased production of tropical-grown materials formerly imported from outside the hemisphere. El Oro is swinging into new hemisphere production rhythms. The province is producing more food for local consumption. It is increasing for local use or for export the production of such strategic materials as fibers, vegetable oils, rubber, balsa wood. With this diversification of production, El Oro again hopefully looks forward to enjoyment of the fruits of a sounder economy.

To the Orenses, the practical benefits of the revival are becoming manifest. Cocoa, long the chief money crop of the area, now can be shipped in sacks woven locally from fibers grown on El Oro land which formerly produced nothing. Trails are being cut to the rubber-yielding forests of the uplands. And from the latex gathered locally, rubberized sheets are being made for hospital use in the province. Furniture built in local shops from El Oro lumber also goes into hospital equipment. Oil from innumerable palm trees is being collected for soap-making.

This increased self-reliance is timely. For El Oro, like many other areas in Latin America, is forced by wartime necessity, by the scarcity of shipping and difficulty of importing goods, to rely more on home-produced goods, on capacity to utilize local materials and local skills for the essentials of individual and community life.

The Orenses, moreover, are eating better. Demonstration farms and gardens established in the past year are showing the Orenses how to produce additional and nourishing food crops, such as vegetables and soybeans. Superior breeds of livestock have been introduced. Small loans have been made available to help farmers get started. A tractor shows farmers what can be done with modern machinery. To travellers on the Machala-Pasaje Railroad, the white walls of a new demonstration farm symbolize El Oro's revival from the depths of her bleak days.

There are many other marks of this revival on the El Oro landscape. Buildings burned during the 1941 occupation of El Oro are being repaired or replaced. Hospitals and dispensaries are being overhauled and improved. A medical center is being built at Machala, the provincial capital and rail junction. Sewage disposal and water projects are improving sanitary conditions. Puerto Bolivar, gateway to the province, rests securely again behind a restored sea wall. Along the water front of Puerto Bolivar, 10,000 square meters have been filled in with oyster shells. This port improvement project illustrates how the economic revival of El Oro has spread its benefits. The oyster shells were brought in from nearby islands. With the proceeds of these hauls, fishermen were able to buy new canoes and gear. This, in turn, has increased the supply of fish. The revival in El Oro multiplies its benefits, once it is started.

In miniature, the economic history of El Oro repeats a story familiar in other hemisphere tropical areas. El Oro is near the equatorial line, with cool mountains and hot plains, ranging to extreme aridity. Between the mangrove swamps on the coast and scenic grandeur of the Andes are stretches of rich soil, capable of producing good yields of the traditional tropical crops—cocoa, bananas, sugar, coffee, tobacco. Once El Oro was in large part responsible for Ecuador's worldwide fame as a producer of excellent cocoa. But the witchbroom disease and the rise of cocoa plantations in other parts of the world sent Ecuador's cocoa industry into a decline. With this misfortune, El Oro learned the danger of over-specialization. Then came the culmination of the long-standing border dispute, erupting into hostilities in 1941.

The border fighting put El Oro in the news before Pearl Harbor. When the Rio de Janeiro conference of American Foreign Ministers assembled in January, 1942, after the attack on Pearl Harbor, the border conflict was one of the dissonant notes in the theme of inter-American harmony.

The Japanese attack on Pearl Harbor emphasized the menace of Axis aggression in both the Atlantic and the Pacific. For hemisphere defense, Ecuador, on the western bulge of South America, held a vital position. Besides her commanding position on the West Coast of South America, Ecuador owns the Galapagos islands, 500 miles west in the Pacific. These islands are one of the natural guardians of the Panama Canal. Fortunately for the Americas, Ecuador had a wholehearted desire to cooperate in defense of the hemisphere. Conse-

quently, the settlement of the border dispute was one of the notable accomplishments at Rio. Joint frontier commissions were arranged to define the disputed border.

Thus arose the hemisphere's first rehabilitation task in a war-damaged area during this world struggle. With millions of refugees uprooted in the war zones of Europe, Asia and Africa, the El Oro task was obscured in the shadow of overwhelming events abroad. Still the task in El Oro has been a constant reminder of the rehabilitation jobs which will come in the wake of the tornadoes of destruction in Europe, Asia and Africa. Almost unobserved by the world, El Oro has risen from the wreckage of the border dispute and, with a helping Good Neighbor hand, has received a strong start on the road toward a sound economy and higher living standards. This lesson of cooperation in the inter-American Good Neighbor spirit may not be lost in a world groping for peace and economic stability.

But, to resume the narrative, let us return to March, 1942, soon after the settlement at Rio. Thousands of refugee Orenses were crowding back to their rural homes by boat and mule. They had lost or sold most of their possessions. They were hungry and many were sick. Obviously, the first job to be done was emergency relief. The refugees were returning to a waste land. Livestock, tools and food supplies were gone. The railroad and power systems were crippled. Poor water supply, neglected houses, weed-choked streets increased the menace of typhoid, dysentery and malaria.

It was a task the returning Orenses and the government of Ecuador alone could not handle. So the United States, under its policy of inter-American collaboration, offered to assist. The offer was accepted. A mission was dispatched to El Oro, headed by Charles O'Neill, of the Office of the Coordinator of Inter-American Affairs. Also in the mission were Robert Nichols, an agriculturist with tropical experience, and Henry Baker, dean of the American Red Cross disaster relief organization.

By air transport quinine, vaccines, sulfa drugs and other medical supplies were sent to the stricken area. Forty tons of rice, potatoes, beans, onions, evaporated milk and lard were bought and shipped from Guayaquil to feed the hungry. Soap and cooking utensils and more than 1500 machetes, saws, shovels and axes also were shipped to the area.

Promptly, 500 men went to work as sanitary squads to clean the towns and check the danger of malaria. Gradually, economic life be-

gan to revive. The Orenses, backed by the Ecuadorian government, readily accepted their share of the rehabilitation work.

After the emergency relief came the longer-range program. This necessitated an attack on fundamental problems: malnutrition, tropical disease, poor water supply, primitive and run-down communications, damaged houses, schools, hospitals and business facilities.

In collaboration with the Ecuadorian government, the United States mission drew up a program. It covered three principal sections: agriculture, public health and public works. Improvement of agriculture was necessary to feed the people and to provide cash income. Public works were needed to drain swamps, open roads, rebuild towns and better sanitation conditions. Public health required medicines, training of nurses and doctors.

For the main rehabilitation task, the Office of the Coordinator of Inter-American Affairs allotted the sum of $500,000. A group of technicians was assembled as part of the United States contribution. This group included Allen Edwards, West Pointer who organized relief of the Yellow River flood and famine in 1931-32 before business took him to Latin America; John Lassiter, with a long record of emergency relief services and administrative work in the Caribbean; Philip Ovalle, Colombian-born and Colombia-trained physician, who fashioned a second Gorgas miracle in an oil camp on the upper Magdalena; Lee Husinger, with thirty years of tropical experience as a banana engineer; Gardner Gantz, who learned his practical engineering in Peru and Venezuela; Angel Sandoval, Honduran-born graduate of New Mexico's agricultural school, who was recruited from the Soil Conservation Service; William Howard, tropical livestock specialist; Kelervo Oberg, anthropologist, who moved from the African veldt to rural economics in the southwestern states; Angela McCutcheon, social worker of Uruguayan extraction, who had specialized in service among Spanish-speaking groups in New York City; Isabel Needham and Helen Freeman, nurses who learned their Spanish dealing with Spanish war casualties.

This mission was assigned to the newly-organized Ecuadorian Development Corporation, formed to develop the economy of Ecuador as a whole. One of the objectives of the mission from the start was to train the local people so they could carry on when the mission completed its work. Young Ecuadorians have been employed wherever possible in a combination of work and training. The program has

been developed to make as little demand as possible for machinery and materials imported from the outside. This has been made necessary in part by the concentration of United States industry upon war work. At the same time, this policy has enabled the Orenses to gain experience and to observe what can be accomplished with materials at hand.

The El Oro work has enlisted the services of engineering students of the Guayaquil and Quito Universities, physicians and nurses, agricultural specialists, apprentices for administrative and other advanced tasks. On the labor payroll are more than 1,000 persons paid at a wage scale set by Ecuador's Department of Labor.

With the cooperation of the Ecuadorian government and under the broad program of the Ecuadorian Development Corporation, the mission has moved toward its goals in the field of agriculture—diversification of crops, subsistence farming, improvement of livestock, aid to small farmers through loans and demonstration of modern farming techniques. A 75-acre tract was acquired for a demonstration farm. This farm includes a model acclimation pavilion, poultry house, a dairy and abattoir. Twenty-five acres have been planted with fodder. Seedlings are being produced for distribution to farmers. This project shows Orenses how they can grow profitably such crops as soybeans; barbasco, source of rotenone; and oil-bearing crops, such as sunflowers. Demonstration gardens have been established throughout the province to encourage the growing of vegetables to improve diet.

Loans, ranging up to $100, have been made to enable small farmers to get started. These loans are passed on by committees of local people. Many of the loans are being repaid out of the resulting production. Farmers are repaying in kind, returning birds for eggs, sucklings for sows.

Rubber is another illustration of how the Orenses get started. The forests of the uplands contain much natural wealth, including balsa wood and oil-bearing trees, in addition to rubber. The United States Rubber Development Corporation supplies machetes. These are distributed to rubber tappers, to be paid for at the rate of 15 pounds of crude rubber for a machete. The machete is the essential tool of the tapper.

Thus, with the loan of a tool, the Orense gets a start toward making his country yield its natural wealth for the new marketing

opportunities which have risen since the years when cocoa alone meant gold to El Oro.

Among the newer crops, fiber-growing especially holds promise of economic returns for El Oro. The Americas use tremendous quantities of fibers, such as jute, sisal and hemp, for sacks, ropes, twine. Fiber needs for handling staple crops like coffee, cocoa and grain are enormous. Most of these fiber needs have been covered by imports from the Far East. Jute for bagging has come from India, manila hemp from the Philippines. Now, with the loss of imports from the Far East, this hemisphere finds it urgent to increase production of fibers.

And El Oro, recovering from her troubles, has fallen in step with the hemisphere swing toward increased production of fibers for home needs. Cabuya and other fiber plants grow wild in the province. Fibers can be cultivated readily.

To show what can be done, three demonstration plots have been planted with cabuya. Nurseries annexed to these demonstration plots have 175,000 seedlings for eventual distribution. Fibers have been introduced from Mexico and Colombia for experimental purposes. One objective is to demonstrate how arid land can be used for fiber cultivation.

Meanwhile, five decorticating plants have been established to process fiber. Wild cabuya will supply these until plantation growths come into production. At Santa Rosa a complete spinning and weaving factory has been installed. Indian fiber-weaving experts have been brought down from the mountains to teach the local people their craft. The production capacity of this factory is thirty bags daily. The factory has provided jobs for many people, especially women. Some who started as apprentices now are working as skilled weavers and spinners. Young people from the Santa Rosa rural normal school have been given opportunity to secure practical experience in the factory.

These beginnings make a base for larger-scale developments of El Oro's fiber industry. After local needs have been covered, hemisphere markets offer ample outlets for whatever surplus El Oro can produce. This is the prospect, too, for El Oro's increasing production of rubber, oils, balsa wood. Ecuador is supplying rubber, balsa wood, quinine to the United States and is stepping up production. Reviving El Oro is contributing to this flow of strategic materials.

It is another instance of how inter-American cooperation pays off in practical terms.

More than 70 per cent of the population of El Oro depends upon the harvest from the chief agricultural crops. That is the big reason why good harvests of rice, cocoa, tobacco this year mean better times for the Orenses.

Another reason for the better times is that the rehabilitation work has facilitated the return to the land and to subsistence farming by many families through distribution of seed, tools, poultry, pigs, cattle.

El Oro livestock raisers are stocking pastures with beef cattle, some purchased with the help of private loans on recommendation of the technical mission. Prize livestock, including Ayreshires, Brown Swiss and Duroc-Jersey hogs, have been imported into the province. Some of these have been brought in by Mr. Howard, the livestock expert, from Venezuela. Fine-bred poultry also have been acquired, some from as far away as Chile. These include Rhode Island Reds, Plymouth Rocks, Catalana Prats. Excellent varieties of ducks and turkeys have been introduced. These, along with the vegetables, mean better eating for the Orenses.

The rehabilitation work in El Oro province is a unified program. From the start it was essential that it be a unified program ranging from immediate relief to basic work in food and health. The health work emphasizes reorganization and training. At Machala, a medical center is being built to provide surgical, obstetrical, pathological, isolation and training services. Malaria control involves a variety of projects for elimination of mosquito breeding places, general improvement of sanitary conditions.

In this work, Ecuadorians take keen interest. This was illustrated recently when a 30-piece band, loaned by the Carabineros of Guayaquil, spent a week in the province enlivening dances, parades and athletic contests given as benefits for a hospital fund. Committees representing local government, labor, churches, schools, farmers, women's organizations provide leadership in community work. The small loan committees are points of cooperative contact between the technicians and the local people. Quick response from the Orenses has been forthcoming in projects for building trails and feeder roads.

This local interest is vital to the success of the rehabilitation program. For, in the long run, it is the Orenses themselves who must

do most of the work, who must continue when the United States technicians depart. Much of the work will continue in the long run through the Ecuadorian Development Corporation. This corporation functions with the aid of a $5,000,000 credit of the Export-Import Bank of Washington. It has three representatives of the United States and three of Ecuador on its board of directors. Essentially this, too, is an Ecuadorian undertaking. Hence there is stress on training to pass on skills, initiative, experience which specialists from the United States have brought to El Oro.

In this remote spot in the Western Hemisphere, so far removed from the battlefields of Europe and Africa, the Americas are learning useful lessons in the rehabilitation of a war-damaged area. Perhaps it is too soon to try to appraise the value of these lessons. The great rehabilitation tasks lie ahead after victory is won in the global struggle. The rehabilitation tasks of Europe and elsewhere will involve problems of far greater weight than those which have confronted the technical mission in El Oro. Nevertheless, the El Oro program shows what can be accomplished through cooperation. The revival in El Oro, small though it be in relation to great world problems, is a living example of what nations can achieve by working together for a common interest. El Oro, Ecuador, the United States and all the Americas are gainers by the change which has come over this erstwhile hemisphere sore spot.

SELECTED ABSTRACTS

Sulfanilamide Suppositories in the Treatment of Vaginitis and Cervicitis. L. F. Herz. *N. Y. Physician 21,* No. 4, 21 (1943). The history of the use of sulfanilamide for the treatment of various diseases is briefly reviewed. Numerous authors have reported that local applications of the drug have proved superior to oral administration.

A series of cases was treated by means of "Vagicol 47" suppositories, each containing 10 grains of sulfanilamide with added lactic acid and having a pH of 5.5. A vaginal suppository was inserted once daily; no other local treatment was given. No undesirable local or general symptoms attributable to the treatment were noted.

It was found that sulfanilamide is absorbed from the vagina to only a slight extent. One case receiving double the usual dose showed after four days a drug concentration of 0.15 mg. per cent.

The cases treated were grouped as follows: (1) trichomonas infection; (2) streptococcic infection, chiefly anaerobic and nonhemolytic; chronic cervicitis; and (3) gonorrheal vaginitis. In some instances there was no follow-up on certain patients after treatment had been started; such cases are not included in the author's summary of data.

Improvement or cure occurred in 58 per cent of seventeen cases in Group 1 and in 87.5 per cent of twenty-four cases in Group 2. Only three cases were seen in Group 3, and of these one was unable to continue treatment; one case was cured and the other improved.

Th observations made during the entire course of treatment of each case are presented in tabular form.

The Synthetic Estrogen Octofollin (in Oil): Report of Clinical Investigation. A. R. Hufford. *J. A. M. A. 123,* 259 (1943). In a series of twenty-one cases octofollin, which chemically is 2,4-di(*p*-hydroxyphenyl)-3-ethyl hexane, was administered in oil by

deep intramuscular injection with satisfactory results. The patients ranged from mild menopause types to those with the more severe symptoms of the surgical menopause.

The amount and frequency of the dosage was varied according to the type of patient and the severity of the symptoms. From 2 to 5 mg. were administered either once or twice a week for several weeks, after which the frequency of dosage was diminished.

No toxic symptoms or local reaction at the site of injection were observed. Gastrointestinal disturbances, dermatitis, vaginal bleeding, and pelvic pain or discomfort were absent. Five patients were given liver function tests; of these, four showed normal function both before and after therapy. The fifth case had latent syphilis and chronic cholecystitis, and exhibited a 2 plus cephalin flocculation test both before and after six months of octofollin therapy.

An improvement was noted in the blood pressure of several patients displaying hypertension.

Octofollin, a New Synthetic Estrogen. H. K. Roberts, E. Loeffel and C. M. MacBryde. *J. A. M. A. 123,* 261 (1943). Observations on a series of forty-four cases exhibiting estrogen deficiency indicate that octofollin administered orally in a daily dose of from 5 to 10 mg. for continuous treatment or from 10 to 15 mg. for interrupted treatment is effective in relieving hypogonal symptoms in women and is relatively nontoxic.

Of the forty-four patients, thirty suffered from symptoms of spontaneous menopause, eleven from artificial menopause following operation, and three from primary hypogonadism. All complained of severe symptoms of vasomotor instability. The latter symptoms were greatly relieved in twenty-three patients; fair relief was obtained in ten cases, poor in four, and there was no improvement in one. In a number of cases hot flushes, headaches, nervousness and fatigability were eliminated or diminished.

Nausea was absent in all cases. Three patients experienced discomfort in the pelvis, and several noted tenderness of the breasts and increased pigmentation of the areolae when given 10 to 15 mg. daily. Vaginal bleeding occurred after interruption of treatment in three of eighteen cases.

Vaginal smear studies indicated that, per mg., the estrogenic effect of diethylstilbestrol administered orally is at least five to ten times as great as that of octofollin.

Hepatic function tests and examination of the blood and urine revealed no toxic effect attributable to medication with octofollin.

One of the authors of the present paper has previously studied the changes which occur in the bone marrow of dogs following the intramuscular administration of diethylstilbestrol dipropionate in olive oil or alpha estradiol in sesame oil. For the former drug a total of 210 mg. given during twenty-one days, or an estrogenically equivalent amount of the latter injected during thirteen days, has been demonstrated to produce leukocytosis, thrombocytopenia and death in dogs. In similar studies on two dogs reported in this paper each animal received approximately 780 mg. of octofollin in sesame oil by intramuscular injection over a period of eighty days. Pronounced changes in the peripheral blood occurred in only one dog, indicating that octofollin, by this test, is much less potent than the other two estrogens mentioned.

Sulfonamide Therapy in Dentistry: A Review. P. A. Rosamilia. *J. A. D. A. 30,* 1706 (1943). The introduction of sulfanilamide into medicine is briefly traced from its synthesis in 1908 by Gelmo. The chemical, physical and therapeutic properties of the sulfonamides are presented, as well as recommendations as to dosage. Symptoms of toxicity resulting from the use of these drugs are enumerated.

The dental literature reporting the use of the sulfonamides is reviewed quite completely. Applications in dentistry include root canal therapy, the treatment of infections following extraction, the treatment of fractures, and in conjunction with other therapy in subacute bacterial endocarditis. Reports on the use of the sulfonamides in pyorrhea and Vincent's infection appear to indicate that these drugs are valueless in such cases.

The indiscriminate use of the sulfonamides by the dentist is to be discouraged, since acquired hypersensitivity to them appears to be on the increase.

A 5 per cent ointment of *p*-nitrobenzoic acid has been used with success for postextraction prophylaxis in the following instances:

dental abscesses; ankylosis of teeth by sclerosis of bone or condensing osteitis, and lack of blood clot; and in the surgical removal of impacted teeth. It is of interest to note that *p*-nitrobenzoic acid, unlike *p*-aminobenzoic acid, displays no antagonism toward the sulfonamides.

Ninety-eight references to the literature are cited.

The Prevention of Autoxidative Rancidity in Fats and Oils. E. Boehm and R. Williams. *Pharm. J. 97,* 163 (1943). The production of rancidity in fats and oils through spontaneous interaction with atmospheric oxygen is a process which is autocatalytic in nature. An initial slow phase (induction period) is characterized by an almost constant velocity; this is followed by a period of more rapid reaction. The mechanism of the induction period involves the formation of peroxides which then cause the destruction of the antoxidants present in the unsaponifiable fraction.

The observation of earlier workers that concentrates of natural antoxidants or "inhibitols" failed consistently to stabilize the vegetable fats from which they were derived is now explained by the fact that the tocopherols, which are of widespread occurrence in such oils, are most effective at lower levels of concentration; for a given oil there is an optimum concentration of tocopherols to provide maximum stability.

The synergistic action of certain combinations of antoxidants was first pointed out by Olcott and Mattill in 1936. From their observations they suggested the following classification of these substances:

(1) Acid type, which includes some inorganic acids, e. g., phosphoric and sulfuric acids, and also certain organic acids in which the carboxyl group is activated by the close proximity of a second carboxyl group, or carbonyl or hydroxyl group. This type is an effective antoxidant for vegetable oils and their crude esters.

(2) Inhibitols and hydroquinone. These inhibit the oxidation of distilled esters of vegetable oils, lard, esters of lard, distilled fatty acids and esters.

(3) Phenolic type. Substances of this class are effective antoxidants for animal and vegetable oils.

It was found that when an antoxidant of Class 1 was used in conjunction with one from Class 2 or 3 the induction period of an animal fat was prolonged to an extent much greater than would have been predicted from the known effect of each substance used separately. The authors refer to the explanation of this phenomenon suggested by Golumbic in 1942.

Among the best known antoxidants are certain inorganic acids, phenols, substituted aromatic amines, and aliphatic acids. Of the phenols, hydroquinone, catechol, pyrogallol, and 1,2,4-hydroxyhydroquinone are the most common. On the other hand phenol, resorcinol and phloroglucinol do not possess marked antoxidant properties. This leads to the conclusion that the antoxidant activity of a substance depends not only upon its having more than one hydroxyl on an aromatic nucleus, but also upon the relative positions of these substituent groups.

The authors have recently reported an investigation of the antoxidant properties of *n*-propyl gallate (Nipa 49) on a wide variety of animal and vegetable oils.

The Treatment of Burns of the Extremities with Close Fitting Plaster of Paris Casts. S. M. Levenson and C. C. Lund. *J. A. M. A. 123, 272* (1943). Close fitting plaster of paris casts were used in the treatment of burns of the hand, forearm and arm suffered by eight patients for whom case reports are presented. An addendum to the paper reports the satisfactory treatment of fourteen additional patients by this method. In the latter group casts were applied to sixteen arms and legs, four chests and four legs. Third degree burns were present on four of the arms and hands and on all of the legs.

In this method of treatment one layer of sterilized petrolatum gauze is applied to the skin over the entire area which is to be covered by plaster. This layer is fitted exactly and is carefully placed between the fingers, and over it are placed four layers of sterile open mesh gauze, fitted without overlapping, and enclosing only the thumb. The fingers are placed in a semi-flexed position. A thin layer of rolled plaster completes a light cast which is fitted nearly skin-tight, extending three to four inches above the burn.

Tetanus antitoxin is administered in a dose of 1500 units, repeated in five days. In cases where severe burns are also present on other parts of the body sulfadiazine is given in from twelve to twenty-four hours and is continued as long as indicated.

The cast is allowed to remain for fourteen days, and if upon its removal the burn is found to be unhealed, another cast is applied and left on for a second period of fourteen days. Any treatment necessary after the fourth week is by other methods.

Advantages claimed for this technic include the ease of application, comfort for the patient, prevention of swelling, protection against infection and the trauma of transportation, minimal loss of plasma by subcutaneous edema, and the absence of the absorption of such drugs as tannic acid and picric acid, the use of which has been reported in some cases to have caused necrosis of the liver and even death.

SOLID EXTRACTS

We have a long way to go in solving our social problems according to recent statistics from Selective Service. Of a large number of negroes examined in the 18-19 year old group 112 per 1000 were rejected on the grounds of syphilis. Educational deficiency accounted for 121 rejections per 1000 examined. This is not an indictment of the negro race but stark evidence of the lack of a comprehensive overall program of the venereal disease control and education amongst these people.

AJP

Electric lights which can be lighted without any connection to a power source are now an accomplished fact. They receive their energy by high frequency radio transmitted from a power source. Although not yet in the stage of development that makes them practical it may be that some day power "broadcasting" may eliminate the need of electric wiring. The impractical "gadget" of today often becomes tomorrow's most useful tool.

AJP

Washing wounds contaminated with rabies virus with soap solution was shown recently to be more effective than the use of fuming nitric acid. Only 6 per cent of test animals so treated contracted rabies as compared with 11 per cent when nitric acid was used and 63 per cent in a control group. These experiments seem to prove two things, first that the much less painful and injurious soap treatment is superior to nitric acid and cauterization, and second that rabies vaccine should be used regardless of the local treatment employed.

AJP

A new vacuum diffusion process developed by the National Research Corporation of Boston has been announced. It is claimed to be particularly applicable in the final stages of penicillin production, saving several hours as compared with the usual methods of low temperature drying.

Rationing Notes

There was no sugar until the thirteenth century; no coal until the fourteenth century; no buttered bread until the fifteenth century; no potatoes and no tobacco until the sixteenth century; no tea or coffee until the seventeenth century; no telephones, no gas and no matches until the nineteenth century.

AJP

"What we of the business world generally associate with post-war planning are research on new products and study of new methods of doing business. But even this practical approach has no promise of accomplishment unless it is done in an atmosphere of confidence that certain basic concepts will endure.

"The most important of these concepts—the one whose challenge by the Axis has convulsed the world—is FREEDOM. This is recognized at the international level by the Four Freedoms of the Atlantic Charter. What we must keep in mind and keep before the American public is that we cannot hope to advance that charter for other peoples through any planning that deprives us of our historic American charter: Free Enterprise. And I would emphasize Enterprise. We do not ask for freedom to lean upon a subsidized shovel but for freedom to exercise abilities which provide the driving power for all permanent progress—initiative, resourcefulness, perseverance, thrift and willingness to take chances when reasonable rewards can be expected. Freedom, in short, to carry on the post-war world, adapting ourselves to liberalized peace-time conditions as we now are meeting the emergency situation of a nation at war."—Excerpt from President's address N. W. D. A.

AJP

The substitution of glass jars for cans may well result in a destruction of the riboflavin and even ascorbic acid in preserved fruits and vegetables unless the glass container is protected from light.

AJP

It is claimed that air sickness or sea sickness can be induced by certain colors. Color engineers have found that browns and yellows cause nausea, while greens and blues avert it. One airline was advised to use green sheets as a means of reducing the tendency toward air sickness.

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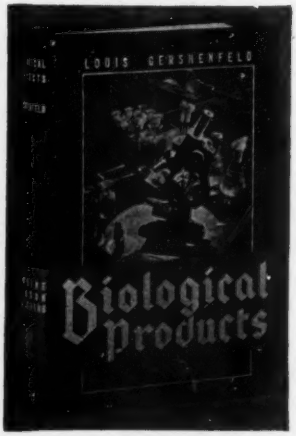

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